

Application No.: 09/436,158
Attorney Docket: AMKOR-019RCE

REMARKS

Summary of the Official Action

Upon entry of the present Amendment, Claims 37 and 40 will have been amended and Claim 38 will have been cancelled without prejudice. Accordingly Claims 13-28, 30-37 and 39-45 are currently pending.

Summary of the Official Action

In the subject Office Action, the Examiner has rejected Claims 13-28 and 30-45 over the art of record. By the present remarks, Applicant submits that the rejections have been overcome, and respectfully requests reconsideration of the outstanding Office Action and allowance of the present application.

Traversal of Rejection Under 35 U.S.C. § 102(e)

Applicant traverses the rejection of Claims 13-14, 17-18, 20-28, 30-37 and 39-45 under 35 U.S.C. § 102(e) as being anticipated by CARTER, Jr. et al. (U.S. Patent 6,211,462) [hereinafter "CARTER"].

CARTER teaches a lead frame having a plurality of leads 203 and a die mount pad 201. The die mount pad 201 extends the full length of the package, as opposed to more typical die mount pads, which extend approximately the length of the chip (see Fig. 2b). Internal portions 203b of leads 203 are sloped upward to near chip height. External portions 203a of leads 203 are flat, and are parallel to the die mount pad 201 and to the bottom of the package. The internal portions 203b are spaced in close proximity to the die mount pad 201 to minimize the total lead inductance (see Fig. 2b). Furthermore, mechanical features or indentations 212 on the upper surface of either end of the die mount pad 201 allow the molding compound 207 to be locked to the lead frame. CARTER states that the indentations 212 on the upper surface of either end of the die mount pad 201 allow molding compound to be locked to the frame (see column 6, lines 3-6).

With respect to base Claims 1, 21, 23, 28 and 37 the Examiner contends that CARTER discloses a semiconductor package which comprises:

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"a metal lead frame, fig. 2b, for example, including a plurality of leads 203 (col. 3, lines 36-38) arrayed around a central region thereof; each lead having an outer end portion 203a extending away from the central region and an inner end portion 203b extending toward the central region, and a middle portion extending between the outer end and inner end portions, the middle portion being of a lead width and having a lower surface which defines a land, see fig. 2a;

a locking pad included in 201 in an outer portion of each lead adjacent to outer end, see details in fig. 2a and col. 3, lines 47-53; see also fig. 2b for the lead having the width exceeds the lead width;

a wire bonding pad on the top end of lead 203b, in the outer end portion of each lead and having a bonding pad width which exceeds the lead width; see also fig. 2b; and,

a die pad 201 attached to the lead frame in the central region thereof and adjacent to the inner ends of the leads, the die pad having an upper surface 200b and a lower surface 201b as shown in fig. 2a, the lower surface having a central portion and recessed shoulder extending around the central portion."

Applicant respectfully submits that the Examiner's rejection of base Claims 13, 21, 23, 28, and 37 (as amended) under U.S.C. § 102(e) is inappropriate.

Claim 13 recites, *inter alia*, a spatulate locking pad in the outer end portion of each lead and having a locking pad width which exceeds the lead width.

Claim 21 recites, *inter alia*, a spatulate pad formed into each of the inner and outer end portions of each lead, each of the spatulate pads of each lead having a pad width which exceeds the lead width.

Claim 23 recites, *inter alia*, a spatulate locking pad formed into an outer end portion of each lead and having a locking pad width . . . the locking pad width . . . exceeding a lead width of a middle portion of each lead extending between the inner and outer end portions thereof.

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Claim 28 recites, *inter alia*, a spatulate locking pad formed into an outer end portion of each lead and having a locking pad width which exceeds a lead width of a middle portion of each lead.

And, as amended, Claim 37 now recites, *inter alia*, at least one spatulate pad formed in the outer end portion of at least one of the leads and having a pad width which exceeds a lead width of each of the middle portions of the leads.

Applicant submits that CARTER fails to disclose at least the above noted features of the present invention. While CARTER teaches indentations 212 on the die pad mount 201, they are not formed into the outer end portions of the leads as recited in Claims 13, 21, 23, 28 and 37. Instead, the Examiner appears to ignore this feature of the Applicant's invention which provides a spatulate locking pad formed in the outer end portion of each lead.

In particular, the Examiner only states that CARTER has "a locking pad included in 201 in an outer portion of each lead adjacent to outer end, see details in fig. 2a and col. 3, lines 47-53; see also fig. 2b for the lead having the width exceeds the lead width". When properly interpreted, the pertinent teachings of CARTER are limited solely to a lead frame including leads 203, each of which includes an internal portion 203b and an external portion 203a. Though the inner end of each internal portion 203b appears to be enlarged, there is absolutely no teaching or suggestion regarding the external portion 203a of each lead 203 being formed to include a spatulate pad having a width which exceeds the width of a middle portion extending between the inner and outer end portions thereof. There is simply no basis from the teachings of CARTER to construe the indentations 212 in the die mount pad 201 as satisfying the limitation of a spatulate pad formed in the outer end portion of a lead as recited in each of the aforementioned base claims.

Therefore, because CARTER lacks at least the above-noted features of the present invention, Applicant submits that CARTER fails to disclose each and every feature recited in base Claims 13, 21, 23, 28 and 37 and that the Examiner has failed to establish an adequate evidentiary basis to support a rejection of anticipation under 35 U.S.C. § 102(b). Thus, Applicant submits that the Examiner's rejection of at least base Claims 13, 21, 23, 28, and 37 is improper and should be withdrawn.

Furthermore, Applicant submits that Claims 14, 17-18, 20, 22, 24-27, 30-36 and 39-45 are allowable at least for the reason that these claims depend from allowable base Claims

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13, 21, 23, 28 and 37, respectively, and recite additional features that further define the present invention.

Accordingly, Applicant requests that the Examiner reconsider and withdraw the stated rejection under 35 U.S.C. § 102(b) and indicate that Claims 13-14, 17-18, 20-28, 30-37 and 39-45 are allowable over the art of record.

Traversal of Rejection Under 35 U.S.C. § 103(a)

Applicant traverses the rejection of Claims 15, 16 and 19 under 35 U.S.C. § 103(a) as being unpatentable over CARTER in view of Yagi et al. (U.S. Patent No. 6,025,040) [hereinafter "YAGI"].

In regard to Claim 19, the Examiner contends that CARTER discloses all the claimed features except the leadframe be made from an alloy of copper, or iron alloy containing nickel. The Examiner then submits that YAGI teaches a leadframe 31 made of an alloy of copper, or iron alloy containing nickel. Next, the Examiner submits it would have been obvious to one of ordinary skill in the art at the time of the invention was made to use such materials as taught by YAGI in the CARTER device since the aforementioned metals have higher conductivity.

With respect to Claims 15-16, the Examiner submits that the aforementioned combination discloses all of the claimed features and the width of the lead's body and its end. However, the Examiner admits that the combination does not expressly teach the exact measurements of the leads. The Examiner then submits that it would have been obvious to a person of ordinary skill in the art to modify the thickness of the leads because the Applicant has not disclosed that these thicknesses provide an advantage, are used for a particular purpose, or solve a stated problem. The Examiner additionally submits that one of ordinary skill would have expected the Applicant's invention to perform equally well with either thickness because they perform the same function of connecting the device, chip, to the leads electrically. Thus, the Examiner submits it would have been obvious to one of ordinary skill in the art to modify the above combination in order to obtain the invention as specified in Claims 15-16.

YAGI teaches a resin-sealed semiconductor device 1 having a semiconductor element 6 fixed to a die pad 2. Terminals 6a are disposed on a pair of sides of the terminal face of the

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semiconductor element 6. Plural terminal portions 4 are disposed along a longitudinal direction of the die pad 2 in such a manner that die pad 2 is placed between the terminal portions 4. A surface of the die pad 2 is integrally provided with plural inner terminals 3A and a back surface thereof is integrally provided with plural outer terminals 3B. The terminal portions 4 integrally have inner terminals 4A on surfaces and outer terminals 4B on back surfaces thereof. The terminals 6a of the semiconductor element 6 mounted on the die pad 2 are connected to the inner terminals 3A of the die pad 2 and the inner terminals 4A of the terminal portions 4 via wires 8. The die pad 2, the terminal portions 4, the semiconductor element 6 and the wires 8 are sealed in the sealing member 9 in such a manner that each of the outer terminals 4B are partially exposed to the outside.

However, YAGI does not teach or suggest any spatulate locking pad in the outer end portion of each lead and having a locking pad width which exceeds the lead width, as recited in base Claim 13. Therefore, since neither CARTER nor YAGI discloses or suggests these features of the invention, no proper combination of these documents can render unpatentable the asserted combination of features recited in at least independent Claim 13.

Furthermore, Applicant submits that Claims 15, 16 and 19 are allowable at least for the reason that they depend from allowable base Claim 13 and recite additional features that further define the present invention.

Accordingly, Applicant requests the Examiner reconsider and withdraw the rejection of Claims 15, 16 and 19 under 35 U.S.C. § 103(a) as being unpatentable over CARTER in view of YAGI, and indicate that these claims are allowable over the art of record.

CONCLUSION

The Applicant respectfully submits that each and every pending claim of the present invention meets the requirements for patentability, and respectfully requests that the Examiner indicate the allowance of such claims.

In view of the foregoing, it is submitted that none of the references of record, either taken alone or in any proper combination thereof, anticipate or render obvious the Applicant's invention as recited in Claims 13-28, 30-37 and 39-45. The applied references have been discussed and distinguished, while significant claimed features of the present invention have been pointed out.

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Further, any amendments to the claims which have been made in this response and which have not been specifically noted to overcome a rejection based upon the prior art, should be considered to have been made for a purpose unrelated to patentability, and no estoppel should be deemed to attach thereto.

Accordingly, reconsideration of the outstanding Office Action and allowance of the present application and all the claims therein is respectfully requested and now believed to be appropriate.

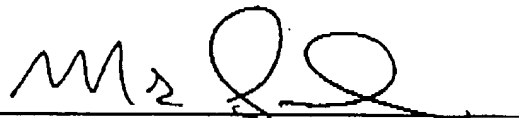
If any additional fee is required, please charge Deposit Account Number 19-4330.

Respectfully submitted,

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